

REMARKS

In the Office Action dated June 3, 2005, claims 1-22 are pending in the above application. Claims 1, 10, and 19 are independent claims from which all other claims depend therefrom. Claims 1, 10, 19, and 21 are herein amended.

The specification stands objected to for informality reasons. Paragraphs [0010]-[0011], [0021]-[0022], [0024]-[0026], and [0032] are herein amended as suggested in paragraph 1 of the Office Action.

The drawings stand objected to because of informality reasons. A corrected drawing sheet is herewith submitted, which includes an amended Figure 1. Figure 1 is amended such that the structure labeled "low-voltage bus" is now labeled "low-voltage bus."

The Office Action states that Figure 1 fails to show an item having numerical designator 35. Paragraph [0021] is herein amended such that "low-voltage device 35" now reads "low-voltage device 35, as shown in Figure 2". Note Figure 2 does show the low-voltage device 35.

The Office Action also states that numerical designator 62 should be mentioned in the written description associated with Figure 2. Paragraph [0027] is herein amended such that the sentence "The converter 44 is electrically coupled to the switch 42" is now "The converter 44 is electrically coupled to the switch 42 and includes internal voltage sensors 62."

Claims 10, 19, and 21 stand objected to for informality reasons. Claims 10, 19, and 21 are herein amended as suggested in paragraphs 5 and 6 of the Office Action.

The Office Action also states that claim 10 is objected to because the specification does not contain a written description for the limitations of "generating a converter circuit status signal" and "in response to said converter circuit status signal." Applicant submits that paragraphs [0035] and [0038] provides such description. In addition, referring to MPEP 2163, which states that there is a strong presumption that an adequate written description of the claimed invention is present when the application is filed. The PTO has the

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initial burden of presenting evidence or reasons why persons skilled in the art would not recognize in the disclosure a description of the invention defined by the claims. See *In re Wertheim*, 541 F.2d 257, 263, 191 USPQ 90, 97 (CCPA 1976). Applicant submits that a claimed disclosure of generating a converter circuit status signal and performing a task in response to that signal is adequate written description for recognition by one skilled in the art. No evidence or reasons have been provided why persons skilled in the art would not recognize in the disclosure a description of the invention defined by claim 10.

Claim 22 stands rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. Specifically, the Office Action states that the specification does not disclose what is meant by executing the high-loading mode on the ISG, or what happens to the ISG after the high-voltage or low-voltage mode is initiated on the converting circuit. Applicant, respectfully, traverses. In paragraphs [0026] and [0028] and elsewhere in the present application it is stated that the ISG 22 operates as a motor during a high-loading mode. High-voltage is transferred from the high-voltage bus to the ISG 22. Paragraph [0026] states that the ISG controller 40 determines whether to convert the electrical energy into mechanical energy in response to whether the system is operating in a high-loading period. The switch 42 is in an open state during high-loading periods and closed during low-loading periods. In paragraph [0027], it is stated that the operation of the switch is based off of the load signal from the load sensor and is operated by the converter, the control circuit, the engine controller, or a separate controller. The ISG 22 acts as a motor during high-loading or high-voltage modes and as a generator during low-loading or low-voltage modes. This is further described in paragraph [0025]. Thus, upon, for example, sensing a high-loading condition the switch is opened. Upon opening of the switch the ISG is operated in a high-loading mode, or in other words, the high-loading mode is executed in the ISG and the ISG performs as a motor. Upon review of the detailed description one can clearly understand what executing the high-loading mode on the ISG means and what happens to the ISG after the high-voltage or low-voltage modes are initiated or began.

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Claims 1, 6-8, 10, 15-17, and 19 stand rejected under 35 U.S.C. 102(b) as being anticipated by Ruthlein et al. (U.S. Pat. No. 5,698,905).

Amended claims 1 and 10 recite the limitations of a converter circuit maintaining a predetermined minimum voltage level on a high-voltage load by switching between a high-voltage bus and a low-voltage bus in response to a load signal. The Office Action states that Ruthlein teaches the stated limitations and refers to the intermediate voltage of 500-1000V, col. 6, lines 58-60, and col. 7, lines 58-67 of Ruthlein for such reliance. Applicant traverses.

Ruthlein in col. 6, lines 58-60, merely states that the intermediate circuit 9 can operate on a medium voltage level of between 500V and 1000V. The operation of a circuit between 500V and 1000V is irrelevant and provides no suggestion of switching between a high-voltage bus and a low-voltage bus.

Ruthlein in col. 7, lines 54-67, discloses the use of a low-voltage distribution system having a rechargeable battery 21 for supplying power to conventional consumers 23, such as headlights and other electronic control components. Ruthlein further states that during normal operation the distribution system is supplied with power from a direct current converter 25. The medium voltage is converted to low-voltage, which may be used to charge the battery 21. Ruthlein states that voltage from the intermediate circuit 9 may be converted to low-voltage and supplied to the low voltage system. This disclosure is irrelevant. The disclosure of converting high-voltage to low-voltage does not provide any suggestion of switching between a high-voltage bus and a low-voltage bus. Ruthlein converts high-voltage of the intermediate circuit 9 to low-voltage to provide power in addition to that provided by the battery 21. In Ruthlein both the intermediate circuit 9 and the low-voltage system are used simultaneously. This is unlike the system claimed in which either the high-voltage bus or the low-voltage bus is utilized in supplying power to the high-voltage load. The claimed high-voltage bus and the low-voltage bus are not utilized simultaneously.

Claim 1 also recites the limitations of switching between a high-voltage bus and a low-voltage bus to maintain a voltage level on a high-voltage load

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other than an engine starter. Nowhere in the stated sections or anywhere else in Ruthlein is the stated limitations taught or suggested. The only up-conversion disclosure provided in Ruthlein is when the generator 7 is being used as a starter and both the intermediate circuit 9 and the low-voltage system are utilized simultaneously to supply power to the generator 7 to start the engine 5. Ruthlein does not provide a high-voltage bus in which other devices other than the generator/starter 7 are supplied high-voltage through up-conversion. Although the motor 1 is coupled to the intermediate circuit 9, it is not supplied power from the low-voltage system, but rather is supplied power from the medium voltage battery 27.

Claim 10 also recites the limitations of a converter circuit generating a converter circuit status signal upon switching voltage supply for a high-voltage load and an engine controller signaling the engine to draw power from the high-voltage bus in response to the converter circuit status signal. The Office Action states that these limitations are disclosed by Ruthlein. Applicant traverses. The Office Action states that Ruthlein discloses a converter circuit generating a converter circuit status signal and refers to the direct current converter 25 for such reliance. Applicant submits that the direct current converter 25 simply converts the voltage level of the intermediate circuit 9 to the voltage level of the low-voltage system or vice versa. Nowhere does Ruthlein disclose or suggest that the converter 25 has logic for the generation of a signal nor are any signal lines to or from the converter 25 shown. Again Ruthlein in col. 7, lines 60-67 discloses this down-conversion. In col. 8, lines 17-24, Ruthlein discloses the up-conversion above-stated. Note also that in Ruthlein when up-conversion is performed that the low-voltage system supplies power to the generator 7 in addition to that provided by the intermediate circuit 9.

Claim 19 recites the limitations of generating a load signal and performing a high-voltage mode and generating a first direction signal when the load signal is greater than a predetermined load. A low-voltage mode is performed and a second direction signal is generated when the load signal is less than or equal to a predetermined load. A bi-directional switch is switched to an

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open state in response to the first direction signal and to a closed state in response to the second direction signal. An up-conversion is performed in response to the first direction signal and a down-conversion is performed in response to the second direction signal to maintain a predetermined minimum voltage level on a high-voltage load.

Note that the Office Action in paragraph 15 admits that Ruthlein fails to teach a bi-directional switch and a bi-directional converter electrically coupled to the bi-directional switch and controlling the switch, the bi-directional converter controlling the direction of voltage conversion from either the high-voltage bus to the low-voltage bus or from the low-voltage bus to the high-voltage bus to maintain the predetermined minimum voltage level on the high-voltage load. Applicant agrees. Applicant submits that Ruthlein also fails to teach or suggest the performing of a high-voltage mode and the generating of a first direction signal when a load signal is greater than a predetermined load, and performing a low-voltage mode and generating a second direction signal when a load signal is less than or equal to a predetermined load. Nowhere in Ruthlein is a first direction signal and a second direction signal generated. Also, although Ruthlein states in col. 7, lines 31-37, that the control systems 11, 13, 15, and 17 can respond by means of sensors to operating parameters of the electric motors 1, the engine 5, and the generator 7, Ruthlein does not describe how such sensors are utilized, what types of sensors are utilized, and what parameters are measured and responded thereto. Of course, any system can respond to sensors and sensors in general exist in the art, but this broad general disclosure is insufficient in as much as teaching or suggesting the novel invention claimed. Since Ruthlein fails to teach or suggest the bi-directional switch and the bi-directional converter it also clearly fails to teach the generation of a first directional signal and a second directional signal, which are generated and utilized by the stated devices.

In order for a reference to anticipate a claim the reference must teach or suggest each and every element of that claim, see MPEP 2131 and *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628. Therefore, since Ruthlein fails to

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teach or suggest each and every limitation of claims 1, 10, and 19, they are novel, nonobvious, and are in a condition for allowance at least in view of Ruthlein.

Claims 2-4 and 11-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Gale et al. (U.S. Pat. No. 6,304,056).

Applicant submits that since claims 2-4 and 11-13 depend from claims 1 and 10, respectively, they are also novel, nonobvious, and are in a condition for allowance for at least the same reasons.

Claims 5, 14, 19, and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Itoh et al. (U.S. Pat. No. 5,796,175).

As stated Ruthlein fails to teach or suggest a bi-directional switch, a bi-directional converter, and any tasks performed in relation thereto as claimed.

The Office Action states that Itoh discloses a bi-directional switch and a bi-directional converter. Applicant traverses. The Office Action refers to the switch 3 and the switch controller 12 of Itoh for such reliance. The switch 3 of Itoh is not a bi-directional switch. Current passes through the switch 3 in only a single direction. Current from the high-voltage battery 4 is supplied to the inverter 1 and the converter 7 only when the switch is closed. Current is not supplied to the high-voltage battery 4. The switch controller 12 is used to control the opening or closing of the switch 3. The switch controller 12 does not convert current or voltage from one state to another state. Note that the converter 7 is also not a bi-directional converter. The converter 7 only converts high-voltage to low-voltage.

The Office Action states that the converter (switch controller) controls the direction of voltage conversion from either the high-voltage bus to the low-voltage bus or from the low-voltage bus to the high-voltage bus. Applicant traverses. The controller 12 closes the switch 3 to perform a down conversion using the converter 7. When the switch 3 is opened power is not supplied to or from the high-voltage power supply 4. Thus, Itoh fails to disclose a voltage conversion from a low-voltage bus to a high-voltage bus.

Referring to MPEP 706.02(j) and 2143, to establish a *prima facie* case of obviousness the prior art reference(s) must teach or suggest all the claim

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limitations, see *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Thus, since Ruthlein and Itoh alone or in combination fail to teach or suggest each and every element of claim 19, Applicant submits that claim 19 is novel, nonobvious, and is in a condition for allowance.

Also, since claims 5, 14, and 21 depend from claims 1, 10, and 19, respectively, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

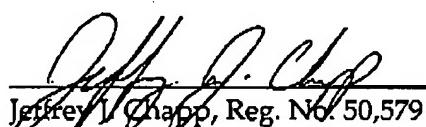
Claims 9 and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Arial et al. (U.S. Pat. No. 6,191,558). Claim 20 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Ruthlein in view of Itoh and further in view of Kanazawa et al. (U.S. Pat. No. 5,767,636).

Applicant submits that since claims 9, 18, and 20 depend from claims 1, 10, and 19, respectively, they too are novel, nonobvious, and are in a condition for allowance for at least the same reasons.

In light of the amendments and remarks, Applicant submits that all of the objections and rejections are now overcome. The Applicant has added no new matter to the application by these amendments. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited. Should the Examiner have any questions or comments, the Examiner is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

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